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DOD WEAPON SYSTEMS SOFTWARE MANAGEMENT STUDY
APPENDIX E, BIBLIOGRAPHY

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THE JOHNS HOPKINS UNIVERSITY ■ APPLIED PHYSICS LABORATORY

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DOD WEAPON SYSTEMS
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This appendix to the DoD Weapon Systems Software Management Study conducted by APL contains a bibliography of the relevant documents acquired and used throughout the course of the study and a brief discussion of an associated Software Library. The Library was established to support the study effort by providing easy access to necessary background material. The acquisition, processing, and circulation of the library documents are discussed along with the various computerized retrieval tools used to provide information about the documents.

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ABSTRACT

This appendix to the DoD Weapon Systems Software Management Study conducted by APL contains a bibliography of the relevant documents acquired and used throughout the course of the study and a brief discussion of an associated Software Library. The Library was established to support the study effort by providing easy access to necessary background material. The acquisition, processing, and circulation of the library documents are discussed along with the various computerized retrieval tools used to provide information about the documents.

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1. INTRODUCTION

This appendix to the DoD Weapon Systems Software Management Study conducted by APL contains a bibliography of the relevant documents that were acquired and used throughout the course of the study. The majority of the documents are generally available.

At the start of the study, it was anticipated that many assorted formal and informal documents would be acquired and used within a short period of time. It became apparent that a Software Library, especially one with a computerized data base, would be an essential device to handle the documents. Accordingly, a Software Library was established to support the study effort by providing easy access to necessary background material. A short discussion of the methods used to acquire, process, and circulate the library documents is included; various library tools such as computer-generated indexes and batch and on-line searching that provided rapid retrieval of desired information are described.

BIBLIOGRAPHY OF RELEVANT DOCUMENTS ACQUIRED

2. BIBLIOGRAPHY OF RELEVANT DOCUMENTS ACQUIRED

The collection consists of formally published documents and draft material from the Department of Defense, the Air Force, Army, and Navy Departments, other Government agencies, commercial contractors, and journal articles. Specific types of items in the library include studies, symposia, technical reports, directives, standards, specifications, and memoranda. The documents are listed alphabetically by title.

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ACQUISITION, PROCESSING, AND CIRCULATION OF DOCUMENTS

3. ACQUISITION, PROCESSING, AND CIRCULATION OF DOCUMENTS

3.1   ACQUISITION

Documents were obtained formally from publishing centers such as the National Technical Information Service (NTIS) or the Naval Publications and Forms Center, or informally through personal contacts with Government and commercial organizations.

3.2   PROCESSING

A document entry form was devised for project personnel to use in assisting the library. Each document was assigned an accession number and cataloged by the library staff. The information recorded for each document included the formal title, a descriptive title using common terminology (e.g., WS 8506), the personal author (if any), the corporate author, the specific originating agency, the report number and date, the classification of the title and the report, the number of pages, the type of document (i.e., Memo, Standard, etc.), subject descriptors, and a brief abstract if available.

All this cataloged information was then typed onto magnetic cards using specific format codes for each data element; it was then edited and stored on an IBM 360/91 computer system. The master file was updated regularly, and a computer-generated list of all documents in the file produced.

3.3   CIRCULATION

All documents and duplicate copies were filed numerically by the Defense Software Study External (DSSX) accession number and stored in file cabinets located in the library. One copy was retained in the library for reference purposes. Additional copies were circulated to study members by a self "checkout" procedure.

INFORMATION RETRIEVAL TOOLS

4. INFORMATION RETRIEVAL TOOLS

Since the material in the library was quite bulky and broad in scope, it was important to use sorting, cataloging, and indexing operations that would make desired information easy to find. Thus, several information retrieval tools were developed. They fell into three interrelated categories: computer-generated indexes, on-line searching, and batch searching.

4.1 COMPUTER-GENERATED INDEXES

The following indexes were generated each time an update was performed.

4.1.1 KWOC Formal Title

The KWOC (Key Word Out of Context) index was an alphabetical listing of key words from the formal titles. Below each key word was a listing of all titles containing that word and the corresponding DSSX numbers. Key words included all informative words in a title (i.e., they excluded "a", "the", etc.).

4.1.2 KWOC Common Title

This index was similar to the KWOC formal title (4.1.1) but used more descriptive or widely used common titles as its base (e.g., "Tactical Digital Systems Documentation Standards" became "SECNAVINST 3560.1 — Navy Tactical Software Documentation").

4.1.3 Corporate Source

The corporate sources in the master file were listed alphabetically, with the associated formal titles and DSSX numbers arranged below each source.

4.1.4 Personal Author

All the personal authors in the master file were listed alphabetically, with the relevant formal titles and DSSX numbers arranged below each author.

4.1.5 Short Document Listing

Not actually an index, this listing presented a skeleton of the master list by displaying DSSX numbers (in ascending order) and formal and common titles of all documents in the library.

4.1.6 Baseline Documents

The Baseline Documents were those designated by various agencies as being significant to the APL study. The titles and DSSX numbers were listed under the alphabetical headings of Air Force, Army, Comptroller, DSS (DoD Software Management Steering Committee), IDA, and Navy.

4.1.7 Originating Source

The document listings were grouped under the headings Air Force, Army, DoD, Navy, Other Government Agency, FCRC, Non-Government Institution, and Commercial Contractors.

4.1.8 Type of Document

The document listings were grouped under the headings of Directive, Memo, Standard, Specification, Study, Letter, Notes, Plan, and Report.

4.1.9 Weapon Systems

Finally, the documents were grouped by the major Weapon Systems investigated.

4.2 ON-LINE SEARCHING

The need for an on-line search program was recognized at the very beginning of the study, and the program was made part of the library from its inception. Actual operation during the course of the study amply confirmed the great value of providing study members with the immediate ability to easily locate relevant material.

The on-line search program was built to operate on the Time Sharing Option (TSO) of the IBM 360/91. Whenever the master file was updated, a copy of the new master file was overwritten on the corresponding TSO file so that the TSO file always contained the latest version of the library.

The actual search program was created as a load module. Various versions of this program (the different versions related primarily to user interactions) were invoked in both Batch (Computer-Generated Indexes, Section 4.1, and Batch Searching, Section 4.3) and Interactive (On-Line Searching, Section 4.2) modes.

The user at the TSO terminal executed a Short Command Procedure (e.g., "EXEC SEARCH") that specified the file to be searched and the load module to be used, and directed output to the terminal.

The search program itself is a "free-format" one; i.e., it can search for any character string in the file. If a "hit" is found anywhere

in a document record (up to 4000 characters long), then user-requested information is displayed. Not surprisingly, the majority of the actual code in the program is devoted to user interaction (menu selection etc.) and display options. The entire file is searched sequentially for each character string requested. The program executes rapidly with several hundred documents in the file, and no timing or excessive cost problems have been encountered.

4.3   BATCH SEARCHING

A batch searching program was generated by modifying the main search program to handle non-interactive input. A variation of this program was also used (as previously indicated) to generate most of the computer indexes. The program could be run from a TSO terminal and was useful whenever a large volume of output was expected. It could be run at any time, in contrast to the Section 4.1 indexes that were generated only during the updating process.

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